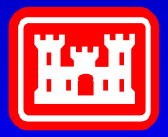
SPiRiT Showcase and Validation Projects

U. S. Army Corps of Engineers

U. S. Army Engineering Research & Development Center

Construction Engineering Research Laboratory



Whole Barracks Renewal, PHII Ft. Richardson, AK

SPiRiT Rating:

- Target Rating – SPiRiT Bronze (25 Points)
- Programmatic Design (Not Applicable)
- Parametric Design – (Not Applicable)
- Final Design – SPiRiT Bronze (26 Points)

Building Statistics:

- Dining Facility
- MCA FY 02, Project Number 052830
- Design Bid Build
- Projected Completion 15 Dec 2003
- Cost $45Mil (PA) $39.187Mil (CWE)
- (Dining) Facility 2117 Square Meters
- (Dining) Facility Footprint 2117 SM
- 251-500 Person Occupancy
- Construction Type (Steel Frame, Masonry Enclosure, Standing Seam Metal Roof)
- 10% Energy Use Reduction

Project Team:

- Design Agent – U. S. Army Engineer District, Alaska
- Public Works Director – COL Dave Snodgrass
- Project Manager - Mr. Chris R. Dalsfoist, POA
- Master Planner – George Newman
- AE – Alaska District In-House with Koonce Pffefer Bettis
- Consultant – Clevenger and Associates
- Contractor – Osborne Construction Company

US Army Corps of Engineers

Whole Barracks Renewal PHII, Ft. Richardson, AK

Life Cycle Synergy

Current Mission

- Furnishing & Finishes Selected for Life-Cycle Durability & Maintenance Ease
- Safe, Healthy, & Functional Work/Living Environment
- Quality of Life Improvements

Green Results

Sustainable Sites

- Constructed Storm Water Management System
- Low Impact Highly Functional Site Selection
- Access to Installation Transportation
- Site Enhancements

Materials and Resources

- Recycled Content Structure

Indoor Environmental Quality (IEQ)

- Mechanical Ventilation to ASHRAE Standards
- Green Seal Paints and Coatings
- Design to Control Indoor Chemicals and Pollutants
- Occupant Temperature & Lighting Controls
- Operable Windows
- Thermal Comfort to ASHRAE Standards
- Daylight & Direct Views
- Acoustic Isolation for Occupant Comfort

Installation Communications Facility

Fort Gordon, GA

SPiRiT Rating:

- Target LEED Gold (39 Points)
- Programmatic Design - NA
- Parametric Design–SPiRiT Gold (56 Points)
- Final Design –SPiRiT Gold (70 Points)

Building Statistics:

- MCA FY 02, Project Number 030629
- Design Build
- 15 March 2004 Projected Completion Date
- Cost $11 Mil (PA) $9.660 Mil (CWE)
- Facility Area 38,000 Square Feet
- Facility Footprint 78,940 Square Feet
- Site Area 398,360 Square Feet
- 75 Person Occupancy
- Construction Type (Steel Frame, Masonry Enclosure, Structural Standing Seam Metal Roof)
- 40% Energy Use Reduction

Project Team:

- Design Agent – U. S. Army Engineer District, Savannah
- Public Works Director – Vincent E. Grewatz
- Project Manager – Efrain Rosario
- Master Planner – Carlton Shuford
- Design/Build Contractor – TENG Construction LLC
- Facility Owner – Directorate of Information Management

US Army Corps of Engineers

Consolidated Library/General Education Center,

Fort Polk, LA

SPiRiT Rating:

- Target Rating – SPiRiT Gold (55 Points)
- Programmatic Design (Not Applicable)
- Parametric Design – SPiRiT Silver (47 Points)
- Final Design – SPiRiT Gold (55 Points)

Building Statistics:

- MCA FY 02, Project Number 002298
- Design-Build
- 31 Jan 04 Projected Completion Date
- Cost $10.8Mil (PA) $10.785Mil (CWE)
- Facility Area 6,900 Square Meters
- Facility Footprint 4,200 Square Meters
- 740 Person Occupancy
- Construction Type (Steel Frame, Masonry Enclosure, Standing Seam Metal Roof)
- 10% Energy Use Reduction

Project Team:

- Design Agent – U. S. Army Engineer District, Ft. Worth
- Public Works Director – Roy Bethel
- Project Manager - Steve Wright
- Master Planner – David Broyles
- Design/Build Contractor – Roy Anderson Corporation

Consolidated Library /General Education Center,
Fort Polk, LA

Life Cycle Synergy

Facility Delivery Process
- Team Selected & Trained in Holistic/Sustainable Design
- Key Team Members LEED Accredited
- Goals & Metrics Established During Project Charrettes

Current Mission
- Operation & Maintenance Manuals
- Furnishing & Finishes Selected for Life-Cycle Durability & Maintenance Ease
- Safe, Healthy, & Functional Work/Living Environment

Future Missions
- Longevity of Materials & Systems Considered

Green Results

Sustainable Sites
- Approved Erosion & Sediment Control Plan
- Low Impact Highly Functional Site Selection
- Located on Installation Transit Line
- Parking Sized /Located for Sharing with Adjacent Future Facilities
- Restored Site Open Areas & Reduced Footprint
- No net Run-Off Increase - Stormwater Management
- Vegetative Shading of Parking Surfaces
- EnergyStar Eligible Standing Seam Metal Roof

Water Efficiency
- Highly Efficient Irrigation

Energy and Atmosphere
- Additional Commissioning

Materials and Resources
- Construction Waste Management
- Recycled Content Materials
- Local Materials

Indoor Environmental Quality (IEQ)
- CO^2 Sensor control over Fresh Air Mix
- VAV Distributed Make-Up Air
- Construction IAQ Management
- Low /Zero VOC Carpets, Paints, Sealants
- Humidity Control and Monitoring
- Environmental Noise Mitigation

Whole Barracks Renewal, Fort Lewis, WA

SPiRiT Rating:

- Target rating - SPiRiT Bronze
- Programmatic Design (Not Applicable)
- Parametric (Concept) Design - (Not Applicable)
- Final Design – SPiRiT Silver (43 Points)

Building Statistics:

- MCA, FY 02, Project Number 041746
- Design Bid Build
- Projected Completion Dec 2003
- Original Cost $48Mil, Reduced to $43 Mil (PA) $37.6 Mil (CWE)
- Facility Area ~15,000 Square Meters (Barracks, 1 BTN HQ, 2 MCOF, 1 LCOF) (Barracks 11,180 SM)
- Facility Footprint ~ 6,200 Square Meters (Barracks 4,100 SM)
- 300 Person Barracks Occupancy
- Construction Type (Type IIB with Steel Frame, Brick Veneer and EIFS Walls, Concrete Tile Roofs)
- 31% Energy Use Reduction (Barracks)

Project Team:

- Design Agent – U. S. Army Engineer District, Seattle
- Public Works Director – Col Steven Perrenot
- Project Manager – MAJ Stephen J. Ward
- Master Planner – Steve Glover
- A/E – USAED Seattle/ WJA
- Consultant – Olympic Associates Co. (VE)
- Contractor – Baugh-Skanska

US Army Corps of Engineers

Validation of SPiRiT Process (Sustainable Project Rating Tool)

U. S. Army Assistant Chief of Staff for Installation Management

Validation Team:
ACSIM: John Scharl
IMA: Cecil Goodwin
USACE: Harry Goradia
ERDC: Richard Schneider

Validation of SPiRiT Process

PURPOSE: Demonstrate Credibility of Army SPiRiT Scoring Process

- **Validate effectiveness of SPIRIT self assessment process**
- **Respond to Project Delivery Team (PDT) questions/concerns**
- **Identify PDT lessons learned**
- **Provide SPIRIT process enhancement recommendations**

Projects Validated:

- **Fort Lewis, WA - Whole Barracks Renewal, NF Area, Phase 1**
- **Fort Richardson, AK - Barracks Complex - D Street, Phase 2**
- **Fort Polk, LA - Consolidated Library/General Education Center**
- **Fort Gordon, GA - Installation Communications Facility**
- **Fort Meade, MD - Child Development Center (Non-showcase)**
- **Camp Carroll, Korea - Physical Fitness Training Center (Non-showcase)**

Validation of SPiRiT Process

Summary Findings:

- Project SDD Teams have undervalued their SPiRiT Ratings
- Confirmed that SDD does not increase project costs
- Showcase Projects have generated increased Command awareness
- Army making progress achieving uniform SPiRiT Gold ratings in FY06

Summary Recommendations:

- Establish Integrated Project Delivery Team including all key stakeholders early;
- Train team in sustainable design and SPiRiT;
- Keep PDT 'energized' and active throughout the life of the project;
- Set SPiRiT Goal(s) and conduct SPiRiT assessment as early as possible;
- Update SPiRiT Score from Project Parametric (Concept) Design Charrette, during design reviews, through Project Beneficial Occupancy Date (BOD); and
- Document SPiRiT points assessment/scoring rationale.

Child Development Center
Fort Meade, MD

SPiRiT Rating:
- Target Rating – SPiRiT Bronze (25 Points)
- Programmatic Design (Planning Charrette/1391) (Not Applicable)
- Parametric (Concept) Design - SPiRiT Silver (31 Points)
- Final Design - SPiRiT Silver (38 Points)
- Current (40% Construction Complete) - SPiRiT Silver (38 Points)

Project Team:
- Design/Constr Agent - U. S. Army Engineer District, Baltimore
- Public Works Director - LTC Rodney W. Gettig
- Project Manager - Scott Drumheller
- Child & Youth Services - Martha McClary & Bea Curl
- Installation Master Planner - Andy Bagnall
- Criteria Development Team Leader - Antoine Plessy
- Value Engineer - John Vogel
- Project Engineer - Pat Sampsel
- Design/Build Team - Samaha Associates, PC & Desbuild Inc

Building Statistics:
- MCA FY 02, Project Number 023721
- Design Build, Army Standard Design
- Feb 2004 Projected Completion Date
- Cost $5.8 M (PA) $6.0M (CWE)
- Facility Area 2,285 Square Meters
- Facility Footprint 2,285 Square Meters
- 303 Child Occupancy + 75 Staff Members
- Construction Type (Masonry Perimeter Bearing Walls, Steel Trusses/Interior Partitions, Standing Seam Metal Roof)
- 10% Energy Use Reduction

Child Development Center
Fort Meade, MD

Life Cycle Synergy

Current Mission
- CDC Standard Design / CDC Accreditation Reqts.

Future Missions
- Furnishing & Finishes and Playground Equipment Selected for Life-Cycle Durability & Maintenance Ease

Green Results

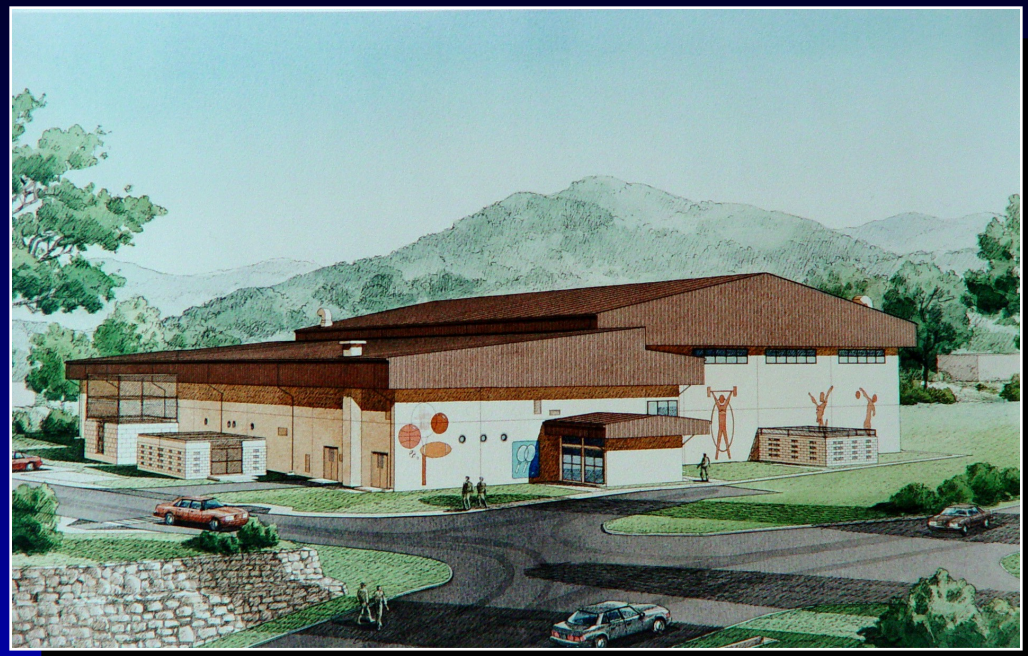
Sustainable Sites
- Stormwater Management & Sediment /Erosion Control Plan to Strict MD DE Requirements
- Shared Parking With Adjacent Facilities
- Existing Stormwater Management Infrastructure
- Reduced impervious area by 35%
- Design Respects/Avoids Adjacent Stream Buffer Area
- Complies With MD Forest Conservation Act Requirements

Water Efficiency
- Maximized Use of Native Plant Species
- Landscape Irrigation System Not Required

Materials and Resources
- Recycled Content Structure

Indoor Environmental Quality (IEQ)
- Adherence to ASHRAE Air Requirements
- Facility IEQ Design to Strict CDC Standards & Guidelines
- Use of Tobacco Products in or Around Facilities Prohibited
- Air Diffusion Maximized for Each Space.
- Filtration Media Replaced Prior to Occupancy
- HVAC System Controls Limit Building Humidity
- Permanent Carbon Dioxide Monitoring System
- Low Emitting Materials; Low VOC Paints & Adhesives
- Natural Day Lighting for All Occupied Spaces
- Sound Attenuation for All Corridors, Modules, Administrative Spaces, & Toilet Rooms
- Design to Control Indoor Chemical/pollutants at the Source

Physical Fitness Center
Camp Carroll, Korea



Project Team:

- Design Agent – U. S. Army Engineer District, Far East
- Public Works Director – Kevin Jung
- Project Manager – Ted Song
- Master Planner – Ronnie Lee
- AE – Far East District Design Branch
- Consultant – N/A
- Contractor – Byucksan Construction Co

SPiRiT Rating:

- Target Rating – SPiRiT Bronze (25 Points)
- Programmatic Design (Not Applicable)
- Parametric (Concept) Design– SPiRiT Bronze (25 Points)
- Final Design – SPiRiT Bronze (28 Points)

Building Statistics:

- MCA FY 02, Project Number 52518
- Design Bid Build
- Dec 2003 Projected Completion Date
- Cost $8.1 Mil (PA) $5.8 Mil (CWE)
- Facility Area 3,296 Square Meters
- Facility Footprint 3,300 Square Meters
- 355 Person Occupancy
- Construction Type - Steel Framing with CMU exterior wall, & Standing seam metal Roof
- 10 % Energy Use Reduction

US Army Corps of Engineers

Physical Fitness Center
Camp Carroll, Korea

Life Cycle Synergy

Facility Delivery Process
- Pre-Design Meeting
- Functional Analysis Concept Development (FACD) Charrette
- Holistic Delivery of Facility

Current Mission
- Quality of Life Improvements
- Operation & Maintenance Considered
- Design for soldier and workforce productivity and Retention

Life Cycle Synergy (cont)

Future Missions
- Longevity of Materials & Systems Considered
- No usage change expected

Green Results

Sustainable Sites
- Erosion & Sediment Control
- Site Selection

Water Efficiency
- Water Efficient Fixtures
- Indigenous Landscape – No Irrigation

Materials and Resources
- Local Materials

Indoor Environmental Quality (IEQ)
- Separate Ventilation System for Smoking Rooms
- Construction IAQ Management
- Low /Zero VOC Carpets, Paints, Sealants
- Individual Room HVAC Control

FY 03 SHOWCASE PROJECTS

SPiRiT	PN	INSTALLATION	PROJECT	
Gold	048707		Fort Benning	Barracks Complex
Gold	041631		Fort Bragg	Barracks, Armistead
Gold	048674		Fort Campbell	Barracks, Range Road
Silver Ave-C	052068		Schofield Barracks	Barracks, Foote
Silver	057341		Fort Wainright	Mission Support Training
Silver	55837	Fort Detrick	Community Support Center	
	54520	Fort Hood	Whole Barracks Renovation	

FY 04 SHOWCASE PROJECTS

PN	INSTALLATION	PROJECT
58604	Fort Huachuca	Army Family Housing
57785	Fort Wainright	Army Family Housing
58677	Fort Knox	Army Family Housing
34082	White Sands	Army Family Housing
44122	Fort Drum	Barracks Complex Phase I
51112	Fort Campbell	Barracks Renewal Phase II
53513	Fort Richardson	Barracks Renewal
44794	Fort Lewis	Barracks
23652	Fort Hood	Barracks
54214	Camp Casey	Barracks
34048	Schofield Barracks	Information System Facility
53321	Fort Gillem	Brigade Administration Facility

FY 05 SHOWCASE PROJECTS

PN	INSTALLATION	PROJECT
57069	Fort Huachuca	Army Family Housing
57073	Fort Richardson	Army Family Housing
57041	Yuma PG	Army Family Housing
57070	White Sands	Army Family Housing
33409	Fort Drum	Barracks Complex Phase II
58799	Fort Campbell	CSG Barracks
36403	Fort Campbell	5th SFG Barracks
44795	Fort Lewis	Barracks
53608	Fort Carson	Barracks
51174	Fort Leavenworth	CGSC
56449	Fort Leavenworth	Instruction Facility
59074	Camp Casey	Senior Leaders Quarters
52263	Schofield Barracks	Whole Barracks Renewal
44795	Fort Irwin	Command and Control Facility

Applications of SPiRiT

INSTALLATION	PROJECT	Rating
DSCC, OH	Physical Fitness Center	Gold
Fort Carson, CO	Training Facility	Silver
Fort Hood, TX	Environmental Training Facility	Platinum
Fort Monmouth, NJ Renovation	Barracks Silver	
Fort Bragg	Installation Design Guide	NA
Korea (FED)	Sustainable Peninsula	NA
FORSCOM	Sustainable Installations (Forts Lewis, Bragg, Hood, Carson and Campbell)	NA
Camp Ederle	Barracks Complex, Vicenza, Italy	Gold

DSCC Physical Fitness Center

DSCC Physical Fitness Center

Project Team:

- Design Agent – Louisville District Corps of Engineers
- Director, DSCC Installation Services– Kenny K. Youn,
- Fitness Center Director - Mr. Craig Lyons
- Project Manager – Lyn Raque, CELRL-ED-M-A
- Master Planner – Anthony Cea, DSCC-WBC
- AE – KZF/BWSC Joint Venture
- Consultant – Gayle Lindsey, Design Harmony, Inc.
- Contractor - Not yet Awarded

SPiRiT/LEED Rating Projections:

- Pre-Design – SPiRiT Gold (62 Points)
- Final Design – SPiRiT Gold (64 Points)

Building Statistics:

- Program MCA , FY 05, PN CSC-98211
- Design Bid Build
- Design Complete Aug 2002 /Project On Hold
- Cost $5.0 Mil (PA) $3.6 Mil (CWE)
- Facility Area 2,694 Square Meters
- 800 Persons/Day Daily Use
- Concrete Masonry Bearing Wall, Steel Roof Framing, Standing Seam Metal Roof)
- 565.25 MJ/SQM/Yr Projected Energy Use

Physical Fitness Center

DSCC (Columbus, OH)

Life Cycle Synergy

Facility Delivery Process

- Team / goal setting charrette / design reviews

Current Mission

- O& M manuals included in final specifications.
- Design incorporated Design Team comments on high quality indoor environment to satisfy users

Future Missions

- Very efficient layout eliminating all unnecessary building circulation / minimal building footprint

Green Results

Sustainable Sites

- Site selected to take advantage of existing adjacent power plant, roads, parking, and water retention basin
- Landscaping to reduce thermal gain and heat islands
- Grass pavement system for required fire truck access

Water Efficiency

- No permanent irrigation system is installed
- Fixtures flow restrictors to achieve a 30% reduction

Energy and Atmosphere

- Designed to achieve TI 800-01 energy performance criteria (required DET 570 MJ/sqm/Yr -- calculated energy usage is 565.25 MJ/sqm/Yr.)
- LCA of energy recovery units, added polyisocyanurate roof insulation, and improved energy efficient windows
- Solar shading for windows / operable windows

Materials and Resources

- Site landscaping from relocated trees
- Use of recycled content steel structure, concrete masonry, and floor finishes
- Excess previous project granite pavers / wall cladding incorporated into exterior finishes

Indoor Environmental Quality (IEQ)

- Use of low / no VOC paint
- User thermal /auditory comfort, views, daylighting and systems controllability optimized for facility function

Ft. Carson Training Facility

Project Team:

- Design Agent - Omaha District, U.S. Army Corps of Engineers
- Public Works Director - Col Hal Alguire
- Project Managers - Linda White, Omaha & Scott Clark, Ft. Carson DECAM
- Master Planner - Bill Davis
- AE - Wilson and Company
- Consultant - HDR, Pacific Northwest National Labs (PNNL)
- Construction Contractor – Torres/Bryant JV – Alliance Sub

SPiRiT/LEED Rating Projections:

- Pre-Design – SPiRiT Bronze (28 Points)
- Final – SPiRiT Silver (48 Points)

Building Statistics:

- Ft. Carson DECAM Sustainable Facilities Demonstration, Funded by FORSCOM P2 Dollars, FY01, UMMCA
- Design Bid Build
- November 2002 Completion Date
- Cost $560,000
- Facility Area 2,800 GSF
- Facility Footprint 3,100 SF
- 70 Person Occupancy
- Cast Concrete, Steel Roof Framing, Standing Seam Metal Roof
- 25% Energy Use Reduction
- Life-cycle Cost Savings Undetermined

Training Facility
Ft. Carson Colorado

Life Cycle Synergy

Facility Delivery Process
- 'Green Team' / goal setting charrette

Current Mission
- Appropriate product selection
- Attention to daylighting / improved IEQ / high quality, functional, healthy interior environment

Future Missions
- Planned life and future uses

Green Results

Sustainable Sites
- Located 2 miles from natural gas fueling station

Water Efficiency
- Low flow toilets and electronic metered water faucets
- No outdoor watering system, xeriscape plan

Energy and Atmosphere
- Building orientation / low emissivity insulating windows
- Natural lighting / reduced cooling/heating requirement
- Electric instantaneous water heaters under sinks
- Natural cooling cupola, no AC
- High efficiency natural gas furnace and good insulation
- Windows and furnace Energy Star compliant

Materials and Resources
- Materials Reuse from demolition projects
- Use of recycled content toilet partitions, insulation, steel structure and concrete
- structure and concrete were locally manufactured

Indoor Environmental Quality (IEQ)
- Use of zero VOC paint
- Sub slab vent system for radon collection and release

Ft. Hood Environmental Training Facility

Environmental Training Facility
Ft. Hood Texas

Life Cycle Synergy

Facility Delivery Process
- Charrette used to identify goals

Current Mission
- Surfaces, furnishings and equipment selected using life cycle cost analysis
- Highly functional, healthy, productive work environment

Future Missions
- Straw panel interior operable wall system
- Conference room suitable for installation wide use

Green Results

Sustainable Sites
- Sited on previously developed land
- Permeable parking surfaces for water quality / runoff control and heat island reduction

Water Efficiency
- Waterless urinals / low flow toilets
- Rainwater collection systems
- Drip Irrigation
- Xeriscape landscaping / drought tolerant landscaping

Energy and Atmosphere
- Straw bale construction / superior building envelope
- High efficiency HVAC unit
- Solar powered parking / site lighting
- Light pipes and/or active (tracking) daylighting fixtures
- Energy efficient windows
- On-demand hot-water
- Interior lighting occupancy sensor controlled

Materials and Resources
- Rapidly renewable materials include straw bale exterior and straw panel interior walls
- Recycled bowling alley floor / salvaged materials
- Recycled Glass in Stucco

Indoor Environmental Quality (IEQ)
- Low VOC paints / non-solvent-based adhesives
- Pre-occupancy mech. and elect. systems commissioning

Barracks Complex Camp Ederle, Vicenza, Italy

SPiRiT/LEED Rating Projections:

- Pre-Design – SPiRiT Bronze
- Final Design – SPiRiT Gold (52 Points)
- LEED Registered
- Target LEED Silver (34 Points)

Building Statistics:

- MCA FY 03 Project Number 55586
- Design Bid Build
- May 2005 Projected Completion Date
- Cost $31,000,000 (PA)
- Facility Area 10,800 Square Meters
- Facility Footprint 3,100 Square Meters
- 300 Person Occupancy
- Cast Concrete, Steel Roof Framing, Clay Tile Roof
- 34% Energy Use Reduction

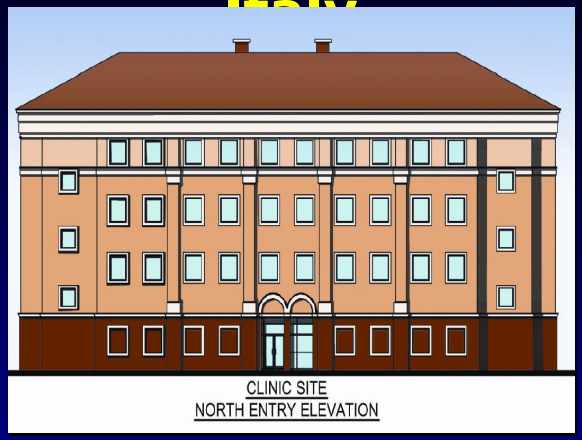
Project Team:

- Design Agent - Naval Facilities Engineering Command
- Public Works Director - Jeff Guyne, Acting
- Project Manager - Al West, PE
- Master Planner - Frank Powell
- AE - Clark Nexsen Architecture & Engineering
- Consultant - None
- Contractor - Not yet Awarded

US Army Corps of Engineers

Barracks Complex

Camp Ederle, Vicenza, Italy



Life Cycle Synergy

Facility Delivery Process

- Pre-Design Meeting
- Functional Analysis Concept Development (FACD) Charrette

Current Mission

- Quality of Life Improvements
- Operation & Maintenance Considered

Future Missions

- Longevity of Materials & Systems Considered
- No usage change expected

Green Results

Sustainable Sites

- Erosion & Sediment Control
- Site Selection
- Energy Star Roof

Water Efficiency

- Water Efficient Fixtures
- Indigenous Landscape – No Irrigation

Energy and Atmosphere

- 34% Energy Use Reduction
- $22,000/yr Savings Building 1
- $34,000/yr Savings Building 2

Materials and Resources

- Local Materials
- Construction Waste Management
- Recycled Materials
- Certified Wood

Indoor Environmental Quality (IEQ)

- Separate Ventilation System for Smoking Rooms
- Construction IAQ Management
- Low /Zero VOC Carpets, Paints, Sealants
- Individual Room HVAC Control

Ft. Monmouth Barracks Renovation

Barracks Renovation

Ft. Monmouth New Jersey

Life Cycle Synergy

Facility Delivery Process
- Trained project team' / goal setting charrette

Current Mission
- Durable surfaces for longevity in barracks
- Instructions for facility operations
- Attention to daylighting / improved IEQ / high quality, healthy interior environment

Future Missions
- Planned life and future uses

Green Results

Sustainable Sites
- Showers / bike racks
- Reduced parking capacity / access to base shuttle bus
- High albedo roof surfaces
- Site-Lighting light pollution compliant

Water Efficiency
- No permanent irrigation
- Low flow toilets and showers

Energy and Atmosphere
- Baltimore District CE / CRREL commissioning reviews of design, construction documents and contractor submittals
- Contractor system / energy management manual.
- Metering through Direct Digital Control (DDC) building control system record data
- Ground source heat pump supplemental heating & cooling

Materials and Resources
- Recycling collection for paper, glass, plastics, and metal
- 75% of existing building shell reused
- Construction waste management specified
- Materials obtained locally

Indoor Environmental Quality (IEQ)
- Permanent carbon dioxide (CO2) monitoring system Specified IAQ management plan
- Low emitting carpeting, adhesives, paints, composite wood
- Operable windows / individual temperature-lighting controls

Points of Contact

- Sustainable Design & Development:
  - U. S. Army Corps of Engineer SDD POC - Harry Goradia, CECW-ET, 202/761-7170, harry.goradia@usace.army.mil
  - U. S. Army ACSIM POC - John Scharl, DAIM-FDF, 703/428-7614 , Email John.Scharl@hqda.army.mil
  - Guidance for Sustainable Building Delivery - Richard L. Schneider, CEERD-CF-E, 217/373-6752, richard.l.schneider@erdc.usace.army.mil
  - Sustainable Designer's Aid - Annette L. Stumpf, CEERD-CF-N, 217/373-7542, annette.l.stumpf@ erdc.usace.army.mil
  - **SPiRiT**: Call Annette or Rich